

REMARKS

Claims 1 and 11 have been amended. Claim 21 has been added. No claims have been cancelled or added. Hence, Claims 1 – 9, 11 – 19, and 21 are pending in the Application.

REJECTION UNDER 35 USC 103(a)

Claims 1 – 9, and 11 – 19 are rejected under 35 USC 103(a) as being obvious over U.S. Patent No. 5,862,331, herein *Heriot*, in view of U.S. Patent No. 5,835,766, herein *Iba*, in further view of U.S. Patent No. 4,853,843, herein *Ecklund*. These rejections are traversed.

Claims 1 and 11, as amended, recite:

registering in a name service participant data that identifies a plurality of participants that are participating in said distributed operation;
wherein said distributed operation is a unit of work involving said plurality of participants;
wherein said name service registers information received from clients and provides said information to clients that request the information, wherein said clients include one or more nodes different than a node on which said name service resides; and causing a particular node of said one or more nodes that requires information about participants in said distributed operation to request said participant data from said name service.

Claims 1 and 11 contain features that are not disclosed in anyway by the cited art. For example, the cited art fails to disclose registering in a name service participant data that identifies participants in a distributed operation, where the distributed operation is a unit of work involving the participants, and causing a particular node different than one on which the name server resides to request participant data from the name service. Furthermore, nothing in the cited art

suggests storing this type of information in a name service on a node and making it available for other nodes to request in this way.

Herriot teaches that a name service identifies components of a distributed computing environment that are capable of performing work, including clients and servers. In teaching this, *Herriot* suggests identifying entities that can participate in a distributed operation. However, *Herriot* does not disclose or suggest in any way that the participants involved in a particular unit of work are identified in any way. In fact, nothing in *Herriot* suggests that a particular task or instance of a service performed by servers or clients are tracked in any way. At best, *Herriot* teaches to use a name service to identify the entities available to provide work, but does not teach to use a name service to store participant data that identifies participants in a name service.

The Office Action further supports the rejection of claims 1 and 11 by alleging that *Iba* suggests the step of causing a node that requires information about participants in a distributed operation to request the participant data from the name service. Apparently, the Examiner bases this allegation on an analogy drawn between the WFG table in *Iba* and the name service in the claims, and between the local lock managers (LLMs) and global lock managers that get data from the WFG table and a node that retrieves information from name service. (See Office Action, page 2, 3rd full paragraph, and section 8).

Even if this analogy were true, which it is not, *Iba* fails to suggest in any way causing a particular node to request participant data from a name service, as claimed. *Iba* teaches that a WFG table is component of either a local or global lock manager or a transaction manager that also contains a global lock manager. (See, for example, FIGS. 3, 6, 7, 9, 27). Thus, *Iba* teaches that the WFG management table and the LLMs and global lock managers that access it are on the same node. (col. 3, lines 48 – 60, FIGS. 3 and 4, col. 9, line 58 – col. 10, line 2, FIG. 9) No teaching in *Iba* suggests that an entity on a node different the node on which the WFG

management table resides can a request information from the WFG management table.

Therefore, *Iba* cannot in any way suggest causing a particular node different than one on which the name server resides to request participant data from the name service, as claimed.

With respect to *Ecklund*, it fails to suggest in anyway a particular node that requests participant data from a name service, where the name service resides on a node different from the particular node. In fact, the Examiner has not even alleged that *Ecklund* suggests a node that retrieves participant data from a name service.

As shown above, nothing in the cited art suggests storing the type of information in a name service on a node and making it available for other nodes to request in the way claimed. Therefore, claims 1 and 11 are patentable. Reconsideration and allowance of claims 1 and 11 is respectfully requested.

NEW CLAIM 21

Claim 21, recites:

wherein the step of registering includes registering for each participant in said plurality of participants, data that identifies said each participant in response to said each participant' commencing participation in said distributed transaction.

The cited art fails to disclose or suggest in anyway registering data that identifies a participant in response to the participant commencing participation in said distributed operation. In particular, *Iba* and *Ecklund*, for reasons mentioned with respect to claims 1 and 11, fail to suggest such a feature.

The Examiner has analogized the information registered by LLMs and stored in the WFG management table to participant data registered in a name source. (See Office Action, section 3, page 5, "wait-for graph (name service), which stores wait-for relation between transactions").

Even if the information may be equated to participant data, *Iba* teaches that the information is registered in response to an LLM being unable to lock a resource (see col. 9, lines 29 – 33), and does not suggest that the participant data is registered in response to a participant commencing participation in a distributed operation, as claimed.

For the foregoing reasons, claim 21 is patentable. Allowance of claim 21 is respectfully requested.

DEPENDANT CLAIMS

The remaining claims are dependent claims, each of which depends (directly or indirectly) on one of the claims discussed above. Each of the dependant claims is therefore allowable for the reasons given above for the claim on which it depends. In addition, each of the dependant claims introduces one or more additional limitations that independently render it patentable. However, due to the fundamental differences already identified, to expedite the positive resolution of this case, a separate discussion of those limitations is not included at this time.

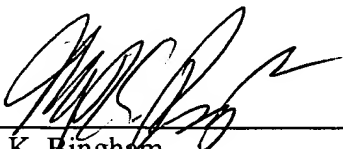
For the reasons set forth above, it is respectfully submitted that all of the pending claims are now in condition for allowance. Therefore, the issuance of a formal Notice of Allowance is believed next in order, and that action is most earnestly solicited.

The Examiner is respectfully requested to contact the undersigned by telephone if it is believed that such contact would further the examination of the present application.

Respectfully submitted,

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Dated: January 22, 2003



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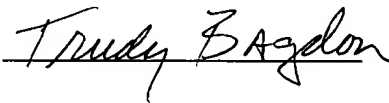
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MARKED VERSION TO SHOW CHANGES

1 1. (Amended) A method of determining participants of a distributed operation in a
2 distributed system, the method comprising the steps of:
3 registering in a name service participant data that identifies a plurality of participants that
4 are participating in said distributed operation;
5 wherein said distributed operation is a unit of work involving said plurality of
6 participants;
7 wherein said name service registers information received from clients and provides said
8 information to clients that request the information, wherein said clients include
9 one or more nodes different than a node on which said name service resides; and
10 causing a particular node of said one or more nodes that requires information about
11 participants in said distributed operation to ~~retrieve~~ request said participant data
12 from said name service.

1 2. (Unchanged) The method of Claim 1, wherein the step of causing a particular node
2 includes causing said particular node to retrieve said participant data in response to said
3 particular node performing deadlock detection.

1 3. (Unchanged) The method of Claim 1, wherein:
2 said distributed operation is a distributed transaction; and
3 the step of registering includes registering in a name service participant data that
4 identifies which database servers of a plurality of database servers are
5 participating in said distributed transaction.

1 4. (Unchanged) The method of Claim 1, further including the step of causing updates to said
2 participant data to identify a new participant in said distributed operation.

1 5. (Unchanged) The method of Claim 4, wherein:
2 said distributed operation is a distributed database transaction being executed by a set of
3 processes coordinated by a coordinator process;
4 the method further includes the step of said coordinator process causing a new process on
5 a database server to participate in said distributed database transaction; and
6 the step of causing updates to said participant data includes said coordinator process
7 causing updates to said participant data in response to said new process
8 participating in said distributed database transaction.

1 6. (Unchanged) The method of Claim 1, wherein:
2 said distributed operation is a distributed database transaction;
3 the step of registering includes registering participant data that identifies which database
4 servers of a plurality of database servers are participating in said distributed
5 database transaction; and
6 the step of causing a particular node includes causing a particular node that requires
7 information about participants in said distributed database transaction to retrieve
8 said participant data from said name service.

1 7. (Unchanged) The method of Claim 1, wherein:
2 said distributed operation is a distributed database transaction;
3 the method further includes the step of assigning a transaction identifier to said
4 distributed database transaction;
5 the step of registering includes registering in said name service data that associates said
6 participant data with said transaction identifier; and
7 the step of causing a particular node includes causing a particular node to request from
8 said name service published data associated with said transaction identifier.

1 8. (Unchanged) The method of Claim 1, wherein the steps further include said name service
2 receiving a request from a first process to supply said participant data, wherein said name
3 service and said first process reside on said particular node.

1 9. (Unchanged) The method of Claim 8, wherein the step of causing a particular node
2 includes said name service retrieving said participant data from one or more data
3 structures residing on said particular node in response to receiving said request.

1 11. (Amended) A computer-readable medium carrying one or more sequences of one or more
2 instructions for determining participants of a distributed operation in a distributed system,
3 the one or more sequences of one or more instructions including instructions which, when
4 executed by one or more processors, cause the one or more processors to perform the
5 steps of:
6 registering in a name service participant data that identifies a plurality of participants that
7 are participating in said distributed operation;
8 wherein said distributed operation is a unit of work involving said plurality of
9 participants;
10 wherein said name service registers information received from clients and provides said
11 information to clients that request the information, wherein said clients include
12 one or more nodes different than a node on which said name service resides; and
13 causing a particular node of said one or more nodes that requires information about
14 participants in said distributed operation to ~~retrieve~~ request said participant data
15 from said name service.

1 12. (Unchanged) The computer-readable medium of Claim 11, wherein the step of causing a
2 particular node includes causing said particular node to retrieve said participant data in
3 response to said particular node performing deadlock detection.

1 13. (Unchanged) The computer-readable medium of Claim 11, wherein:
2 said distributed operation is a distributed transaction; and
3 the step of registering includes registering in a name service participant data that
4 identifies which database servers of a plurality of database servers are
5 participating in said distributed transaction.

1 14. (Unchanged) The computer-readable medium of Claim 11, further including the step of
2 causing updates to said participant data to identify a new participant in said distributed
3 operation.

1 15. (Unchanged) The computer-readable medium of Claim 14, wherein:
2 said distributed operation is a distributed database transaction being executed by a set of
3 processes coordinated by a coordinator process;
4 the computer-readable medium further includes sequences of instructions for performing
5 the step of said coordinator process causing a new process on a database server to
6 participate in said distributed database transaction; and
7 the step of causing updates to said participant data includes said coordinator process
8 causing updates to said participant data in response to said new process
9 participating in said distributed database transaction.

1 16. (Unchanged) The computer-readable medium of Claim 11, wherein:
2 said distributed operation is a distributed database transaction;

3 the step of registering includes registering participant data that identifies which database
4 servers of a plurality of database servers are participating in said distributed
5 database transaction; and

6 the step of causing a particular node includes causing a particular node that requires
7 information about participants in said distributed database transaction to retrieve
8 said participant data from said name service.

1 17. (Unchanged) The computer-readable medium of Claim 11, wherein:

2 said distributed operation is a distributed database transaction;

3 the steps further include the step of assigning a transaction identifier to said distributed
4 database transaction;

5 the step of registering includes registering in said name service data that associates said
6 participant data with said transaction identifier; and

7 the step of causing a particular node includes causing a particular node to request from
8 said name service published data associated with said transaction identifier.

1 18. (Unchanged) The computer-readable medium of Claim 11, wherein the steps further

2 include said name service receiving a request from a first process to supply said

3 participant data, wherein said name service and said first process reside on said particular
4 node.

1 19. (Unchanged) The computer-readable medium of Claim 18, wherein the step of causing a

2 particular node includes said name service retrieving said participant data from one or

3 more data structures residing on said particular node in response to receiving said request.
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1 21. (New) The method of claim 1, wherein the step of registering includes registering for

2 each participant in said plurality of participants, data that identifies said each participant

3 in response to said each participant commencing participation in said distributed
4 transaction.